

New genera and species of leaf beetles (Coleoptera: Chrysomelidae) from China and South Korea

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Abstract

Two new genera from China (*Taumaceroides* Lopatin and *Yunnaniata* Lopatin) and 11 new species (*Smaragdina quadrimaculata* Lopatin, *S. oblongum* Lopatin, *Hyphaenia volkovitshi* Lopatin, *Arthrotus daliensis* Lopatin, *Taumaceroides sinicus* Lopatin, *Yunnaniata konstantinovi* Lopatin, *Calomicrus yunnanus* Lopatin, *C. minutissimus* Lopatin, *Hermaeophaga belkadavi* Konstantinov, *H. dali* Konstantinov from China, and *H. korotyaevi* Konstantinov from South Korea) are described and illustrated. A key to *Hermaeophaga* species of Eurasia is presented. Since *Hermaeophaga dali* was collected feeding on *Paederia foetida* L. (Rubiaceae), which is an invasive noxious weed in the United States, this species has potential as a biological control agent of this weed.

Key words: Leaf beetles, Chrysomelidae, new species, new genera, skunk vine, China, South Korea

Introduction

The Chinese leaf beetle fauna remains one of the least known in the Palearctic Region despite monumental keys published in the early 1960s (Gressitt and Kimoto 1961, 1963). Collecting during the past two decades in the mountains of southwestern China documented a number of previously unknown taxa (Lopatin 2002a, b, 2004, 2005a, b, 2006, 2007). New leaf beetle taxa collected recently in Yunnan and in South Korea are described in this paper. One of them, *Hermaeophaga dali* Konstantinov, new species, was collected feeding on *Paederia foetida* L. (Rubiaceae), which is an invasive noxious weed of Asian origin causing significant damage to natural and agricultural environments in the United States (Pemberton and Pratt 2008). Although one of the largest plant families with about 500 genera and 7000 species (Heywood 1993), Rubiaceae have relatively few species that serve as hosts for Chrysomelidae (Jolivet and Hawkeswood 1995), especially in Asia. So far, only two species of the genus *Trachyaphthona* Heikertinger [*T. sordida* (Baly) and *T. nigrata* Ohno] are known to feed on *Paederia foetida* (Okamoto et al. 2008), making efforts to find biological control agents for Rubiaceae weeds particularly difficult. The discovery of *Hermaeophaga dali* provides an additional potential biological control agent for *Paederia foetida*.

The descriptive terminology for flea beetles follows Konstantinov (1998). Specimens are deposited in the following collections: National Museum of Natural History, Smithsonian Institution, Washington, DC, USA (USNM); Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia (ZMAS); and Institute of Zoology, Academia Sinica, Beijing, China (IZAS).

Clytrinae

Smaragdina quadrimaculata Lopatin, new species

(Figs 1, 2)

Holotype male, China, Yunnan, env. of Lijang, Tiger Leaping Gorge, 2000 m, N 27°04'53" E 100°04'31", 25.05.2002, A. Konstantinov & M. Volkovitsh leg. (IZAS). Paratype female, the same label as holotype (USNM).

Body length 3.0 mm, width 1.5 mm. Body color orange-yellowish, vertex, two spots on each elytron (at basal one third and posterior of middle), metasternum and abdomen black with metallic luster. Three basal antennomeres orange-yellow, rest of antennomeres reddish-brown. Legs orange-yellow, only claw brown.

Frons convex with small impression in middle, covered with small dense punctures. Antennomere three very small, round, much shorter than either two and four. Antennomere four ax-shaped. Antennomeres five to nine wider than long, ten slightly narrower than nine, 11 elliptical with acute apex.

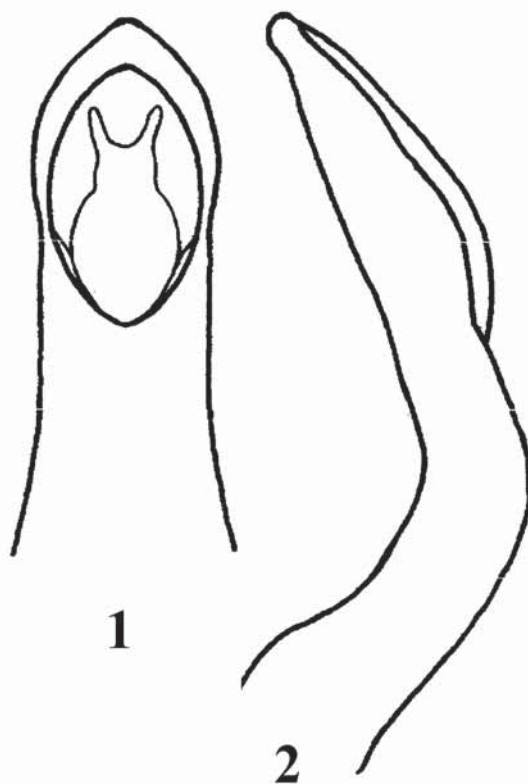
Pronotum twice as wide as long, convex, smooth, with widely rounded posterior corners. Basal margin widely protruding above scutellum.

Elytra 4.7 times as long as pronotum and 1.4 times longer than wide, slightly constricted posterior of humeral callus, widening posteriorly. Elytral apex narrowly rounded. Elytral punctures distinct, relatively deep basally, shallower apically, in some places forming irregular striae.

Ventral side of body with tiny and dense punctures. Abdomen with thin, white, appressed hairs, denser at sides. Aedeagus as in Figs 1 and 2.

Comments: *Smaragdina quadrimaculata* is similar to *S. nigrosignatus* Pic from Fuxian but can easily be differentiated by the color pattern of elytra and the shape of the aedeagus.

Etymology: This species name refers to its body color and the pattern of the elytra.



FIGURES 1–2. *Smaragdina quadrimaculata*, aedeagus. 1, dorsal view; 2, lateral view.

***Smaragdina oblongum* Lopatin, new species**

(Figs 3–6)

Holotype male, China, Yunnan, env. of Lijang, Tiger Leaping Gorge, 2000m, N 27° 04'53" E 100°04'31", 25.05.2002, A. Konstantinov & M. Volkovitsh leg. (IZAS). Paratypes (8 specimens) males and females, the same label as holotype (6 USNM, 2 ZMAS).

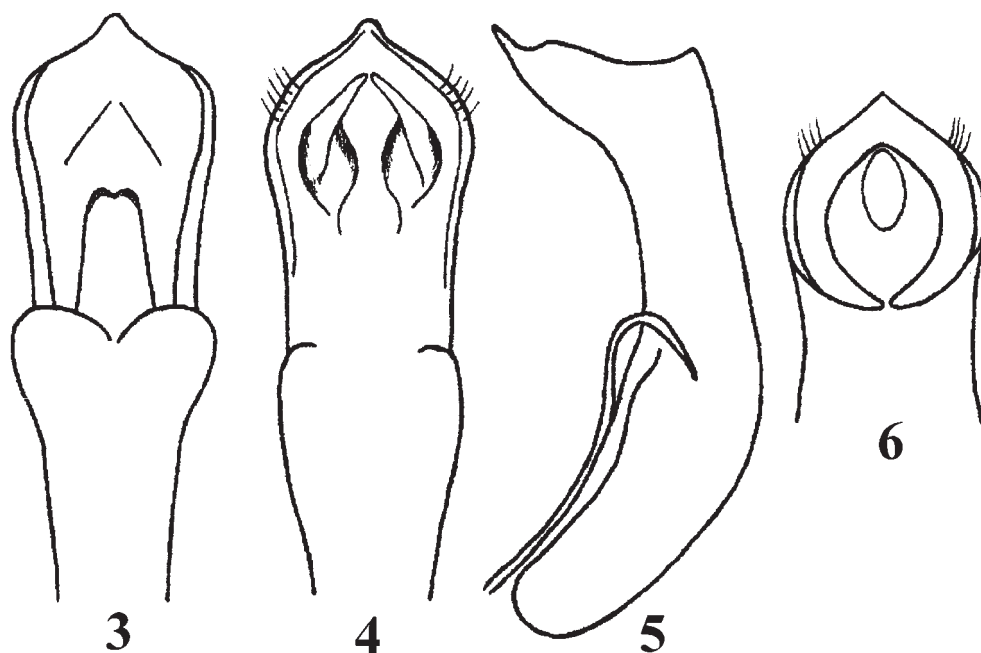
Body length 5.4 mm, width 2.5 mm. Body elongate, parallel-sided, shiny. Pronotum, elytra, four apical antennomeres, and femur except apex, orange. Head, antennomeres five to 11, scutellum, ventral side of body, tibiae, and tarsi black. Labrum shiny black.

Frons between eyes covered with deep wrinkled punctures, which deepen and become sparser ventrally. Vertex covered with tiny, sparse punctures. Clypeus deeply evenly incised. Labrum convex, smooth, with setiferous pores on sides and slightly convex anterior margin. Antennomere three shorter than the rest, wider than long. Antennomere four weakly transverse. Antennomeres five to ten strongly transverse.

Pronotum wide, 1.92 times wider than long. Sides evenly rounded. Posterior corners widely rounded. Pronotum surface smooth, shiny, slightly convex in middle, strongly convex on sides, covered with sparse punctures, which are denser at middle of anterior margin. Transverse impression deep across scutellum. Basal margin protruding posteriorly. Scutellum raised with rounded apex, covered with deep punctures in basal half.

Elytra 2.9 times longer than pronotum and 1.16 times longer than wide, narrowed beyond humeral calli and widening apically, narrowly rounded at apex. Elytral surface covered with shallow punctures, their diameter smaller than distance between them. Lateral sides with row of short hairs.

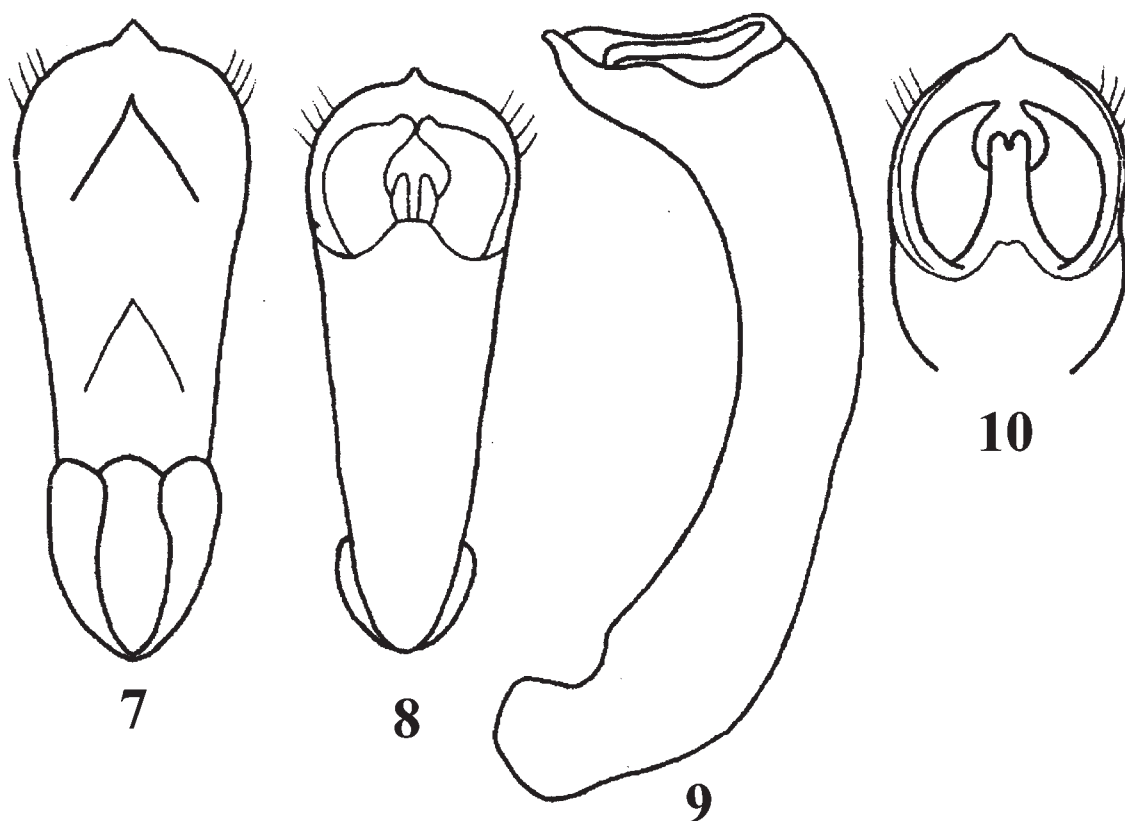
Protibia curved, with dense setae ventrally. Protarsus wide. Claw with small denticle. Abdomen covered with long, white thin hairs and dense punctures. Last abdominal ventrite with short, transverse, bare stripe in middle of apical margin. Aedeagus as in Figs 3–6.



FIGURES 3–6. *Smaragdina oblongum*, aedeagus. 3, ventral view; 4, dorsal view; 5, lateral view; 6, apex.

Comments: *Smaragdina oblongum* is close to *S. peplopteroides* (Weise), from which it can be differentiated by its smaller body, dorsum orange in color (*S. peplopteroides* has elytra either completely dark with light apices or with large elongate markings along suture), dorsal part of vertex sparsely covered with punctures (vertex of *S. peplopteroides* densely covered with punctures throughout), and the shape of the aedeagus (Figs 3–10).

Etymology: This species name refers to its elongate body.



FIGURES 7–10. *Smaragdina peplopteroides*, aedeagus. 7, ventral view; 8, dorsal view; 9, lateral view; 10, apex.

Galerucinae

Galerucini

Hyphaenia volkovitshi Lopatin, new species

(Figs 11–13)

Holotype male, China, Yunnan, env. of Lijang, Tiger Leaping Gorge, 2000m, N 27°04'53" E 100°04'31", 25.05.2002, A. Konstantinov & M. Volkovitsh leg. (IZAS).

Body length 5.3 mm, width 1.8 mm. Most of body, ventral portion of head, gena, pronotum, pro- and mesosterna, and legs yellow. Antenna black, antennomere two entirely and antennomere one ventrally reddish yellow, apical parts of tibiae and tarsi dark.

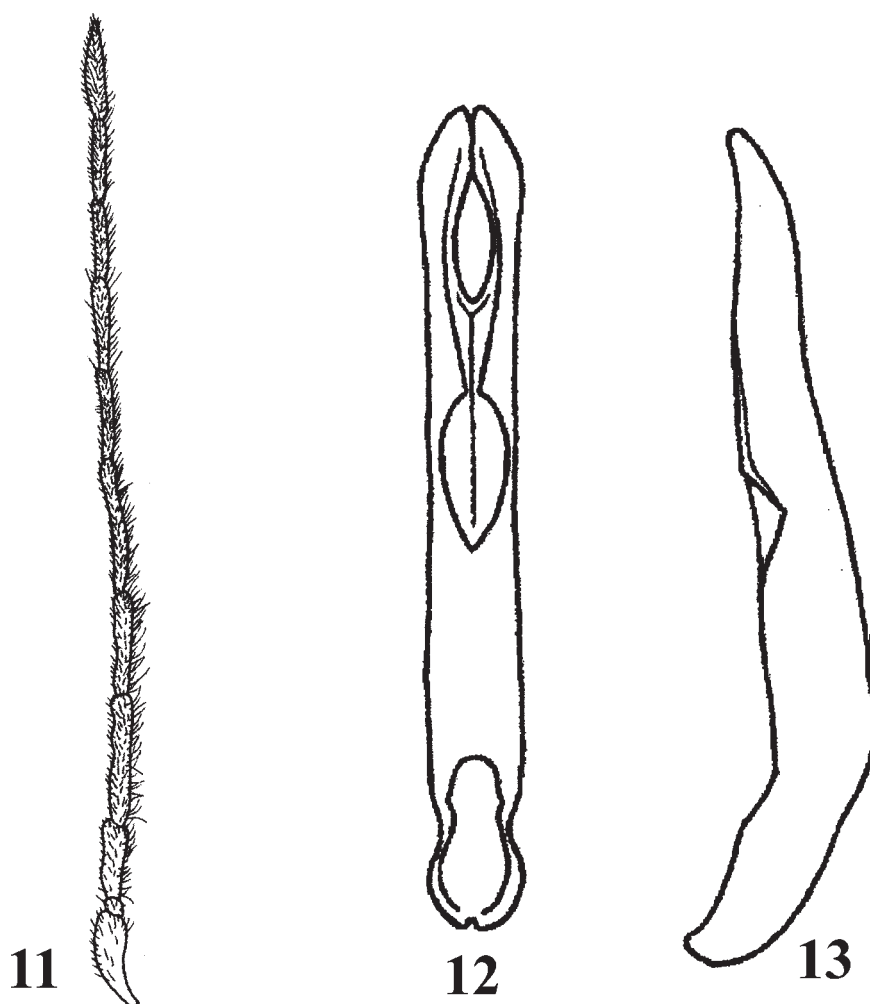
Frons with deep, transverse depression. Frontal ridge short and wide. Antennal calli transverse, convex. Antenna (Fig. 11) long, covered with erected hair starting with antennomere three. Hairs on outer side of antennomeres long, nearly as long as width of antennomeres. Antennomere two short, not longer than its width. Antennomeres four to nine oblique at apices. Antennomere four with two impressions on outer surface. Antennomere five constricted in middle, widening apically. Proportion of antennomeres as follows: 11:2:10:15:13:12:11:10:10:10:11.

Pronotum 1.4 times wider than long. Sides strongly converging from anterior one third posteriorly and weakly anteriorly. Surface with large depressions on sides divided by wide interspace. Lateral margin narrowly explanate. Anterior setiferous pore situated slightly below anterior corner, posterior setiferous pore situated on top of posterolateral corner.

Elytra 4 times longer than pronotum and 2.2 times longer than wide at humeral calli. Elytral surface weakly shiny, covered with dense small punctures, weakening at posterior one third. First protarsomere elongate, as wide as cross-section of profemoral apex. Aedeagus as in Figs 12, 13.

Comments: *Hyphaenia volkovitshi* is similar to *H. bicolor* Medvedev from Thailand, but can be easily differentiated by the shape of the antenna and the aedeagus.

Etymology: This species is named after the collector, M. Volkovitsh.



FIGURES 11–13. *Hyphaenia volkovitshi*. 11, antenna; 12, aedeagus, ventral view; 13, aedeagus, lateral view.

***Arthrotus daliensis* Lopatin, new species**

(Figs 14–16)

Holotype male, China, Yunnan, Dali env., Cangshan Mts., 2100 m, 22.V.2002, foothills with *Cynoglossum*, N 22°41'58" E 100°08'07", leg. Konstantinov & Volkovitsh (IZAS). Paratypes 8 specimens with the same label as holotype (6 USNM, 2 ZMAS).

Body length 5.3 mm, width 1.9 mm. Body elongate oval, shiny. Head, antennae, scutellum, band around elytral bases and their apices, ventral side, and legs black. Pronotum orange, rest of elytra yellow ochre.

Antennal calli small, separated from each other by narrow furrow and from vertex by shallow transverse impression. Frontal ridge convex. Antenna longer than half of body length. Proportion of antennomeres as follows: 8:4:3:12:12:12:13:12:10:10:10. Antennomere two wider than long. Antennomeres four to 10 wide at apices. Antennomeres four to 11 covered by semierect setae.

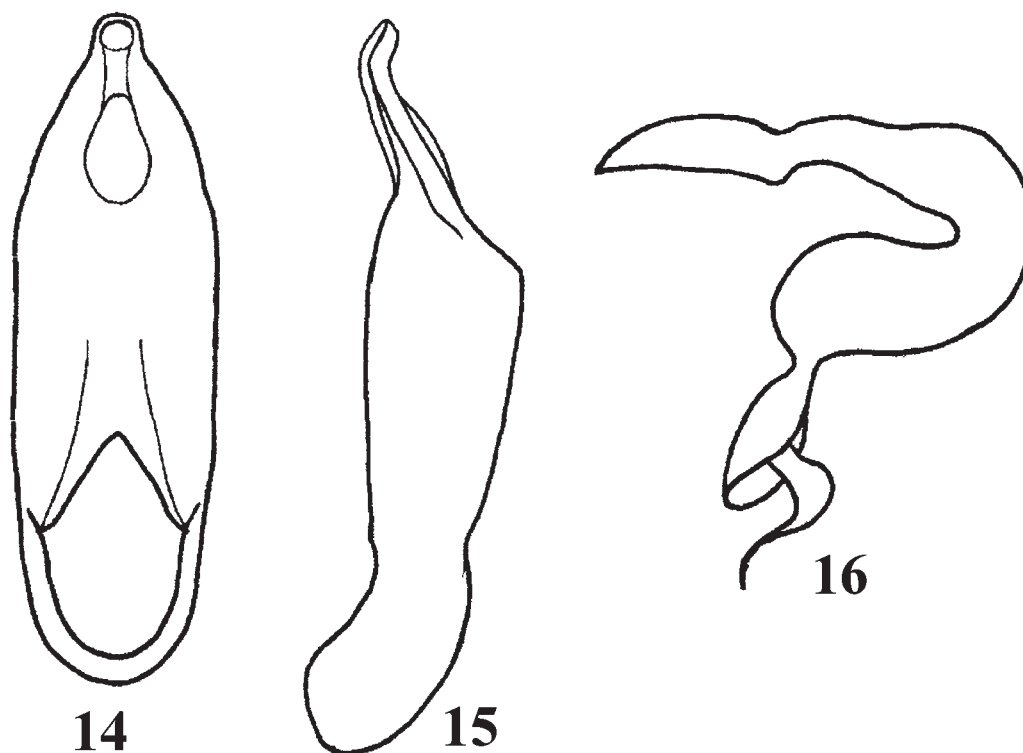
Pronotum trapezoidal, 1.8 times wider than long. Anterior corners rounded, posterior corners blunt. Lateral margins widely explanate, wider at corners. Border along basal margin narrow. Pronotal surface smooth, with light transverse impression behind middle, covered with tiny and sparse punctures on sides. Anterior setiferous pore situated slightly below anterior corner, posterior setiferous pore situated on top of posterolateral corner. Scutellum triangular, smooth.

Elytra 5 times as long as pronotum and 1.9 times as long as their width at humeral calli, slightly narrowing behind humeral calli and widening posteriorly. Elytral punctures moderately dense, more visible than those of pronotum.

Metatibia with thin, small spur. First protarsomere narrow. First metatarsomere longer than three following tarsomeres together. Last abdominal ventrite with three lobes, with rectangular middle lobe. Aedeagus as in Figs 14, 15. Spermatheca as in Fig. 16.

Comments: *Arthrotus daliensis* is similar to *A. freyi* Gressitt & Kimoto and can be differentiated from it by the round anterior corners of the pronotum (the anterior corners of the pronotum of *A. freyi* are slightly elongate laterally with a small denticle facing posteriorly), small punctures of the pronotum (the pronotum of *A. freyi* is covered with large and coarse punctures), the black tibiae (the tibiae of *A. freyi* are orange at least in part), and the shape of the aedeagus.

Etymology: The species name refers to its type locality.



FIGURES 14–16. *Arthrotus daliensis*. 14, aedeagus, ventral view; 15, aedeagus, lateral view; 16, spermatheca.

***Taumaceroides* Lopatin, new genus**

(Figs 17–20)

Body length 4.5–5.3 mm, width at humeral calli 1.7–1.9 mm, width at posterior third of elytra 2.0–2.1 mm. Body elongate, smooth dorsally, without hairs, hind wings well developed. Head with antennal calli nearly quadrate. Supracallinal sulci poorly developed. Midfrontal sulcus shallow but acute. Antennal sockets situated very close to each other. Frontal ridge narrow and relatively short. Anterofrontal ridge thin, well separated from frontal ridge. Gena short. Antennomeres five and six of male strongly modified (Fig. 17).

Pronotum nearly flat in lateral view and almost as wide as long, with lateral and basal margins bordered. Sides gradually widening towards middle and narrowing anteriorly. Disc with wide transverse impression anterior of middle. Procoxal cavities open.

Elytra without callosity posterior of humeral calli. Epipleura strongly constricted at metasternum, narrowing strongly towards apex. Elytral surface uneven, covered with shallow small punctures.

Metatibia thin, cylindrical, without spur. Claw with denticle.

Type species: *Taumaceroides sinicus* Lopatin new species.

Comments: *Taumaceroides* is similar to *Taumacera* in the shape of the pronotum and lack of metatibial spurs. *Taumaceroides* can be differentiated from *Taumacera* by the shape of the facial part of the head. In *Taumaceroides* the frontal and anterofrontal ridges are thin and well differentiated from each other. In *Taumacera* both ridges are thick and together form a relatively long and wide callosity. *Taumaceroides* is significantly smaller than *Taumacera*, which also has mostly yellow or brown elytra with various patterns. The dorsum of *Taumaceroides* is entirely metallic blue. Also, the front legs in males of *Taumacera* are not modified as they are in *Taumaceroides*.

Etymology: The generic name refers to the similarity of this genus to *Taumacera* Thunberg.

***Taumaceroides sinicus* Lopatin, new species**

(Figs 17–20)

Holotype male, China, Yunnan, Rd to Bichuan, 1500 m, N 25°51'00" E 100°34'00", 8.VI.2002, leg. A. Konstantinov & M. Volkovitsh (IZAS); Paratype male with the same data as holotype; male, Xiaguan-Dacang, 19 km, 08.VI.2002, 1900 m, river side, N 25°28'53" E 100°15'42" leg. A. Konstantinov & M. Volkovitsh (USNM); female, Xiaguan-Kunming Rd, 150 km, 10.VI.2002, 1600 m, N 24°59'06" E 101°43'43", leg. A. Konstantinov & M. Volkovitsh (ZMAS).

Body length 4.5–5.3 mm, width at humeral calli 1.7–1.9 mm. Ventral and dorsal sides metallic bluish-violet, shiny, antennae and legs blackish-blue, cavities on antennomeres five and six orange.

Frons and vertex convex, smooth. Antennal calli shiny, smooth, separated by thin furrow, poorly separated from vertex. Frontal ridge shaped as inverted “T”, convex with groups of thin, long hairs on sides of its widest part. Labrum convex with straight anterior margin. Antenna thick with antennomeres five and six modified (Fig. 17). Antennomere two short, ball-like. Antennomere three longer than two, widening apically. Antennomeres five and six greatly enlarged, convex in middle. Antennomere seven fat, cylindrical. Antennomere eight longer and thinner than seven. Antennomeres nine and 10 of same length, shorter than eight. Antennomere 11 longer than 10, acute at apex.

Pronotum nearly quadrate. Pronotal surface with deep transverse impression posteriorly of middle, smooth, shiny, with anterior margin lacking border. Lateral margins narrowly explanate. Sides rounded, nearly straight from posterior margin to middle, posterior angles blunt, anterior angles thick, rounded.

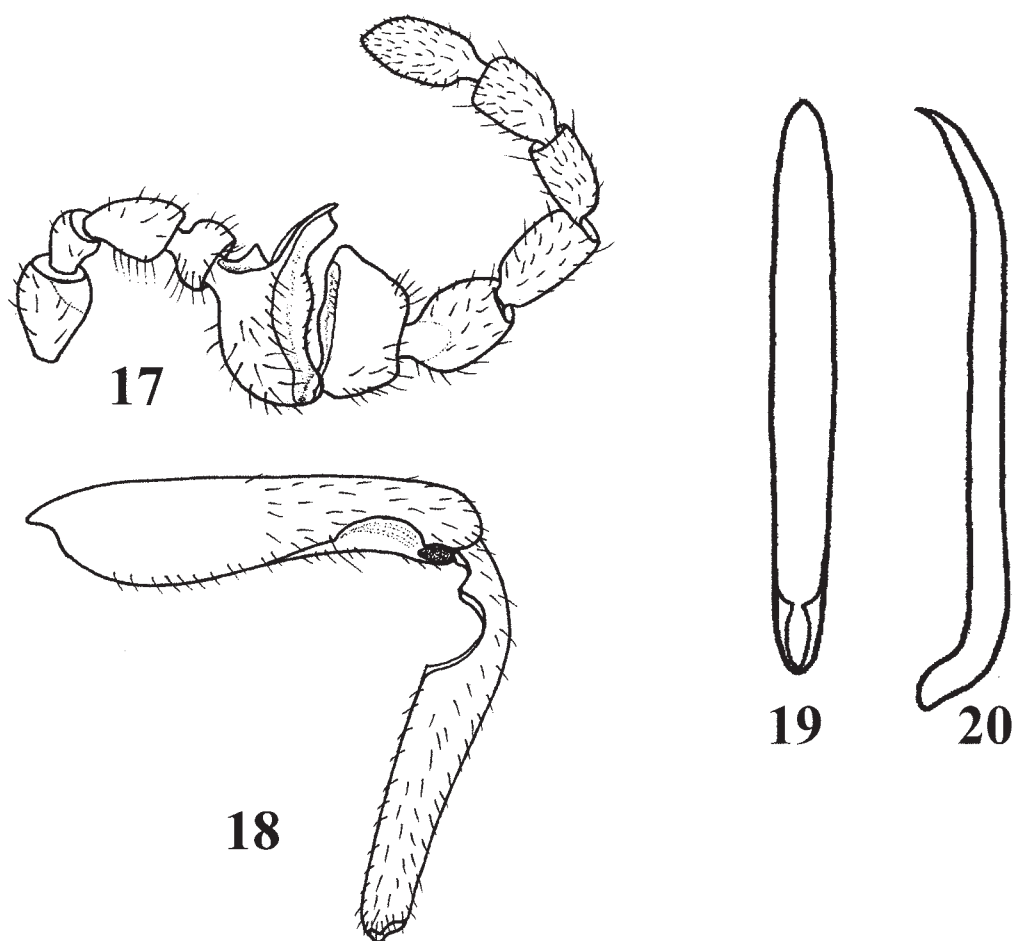
Elytra wider than pronotum as base, nearly parallel-sided at anterior one third, posteriorly widening. Elytral surface covered with very small dense punctures. Lateral sides with very short, sparse, erected, poorly visible hairs.

Profemur with deep incision before apex. Protibia also with deep incision ventrally (Fig. 18). Claws with denticle. Aedeagus (Figs 19, 20) slender.

Sexual dimorphism: Profemur and protibia of female without incisions and their antennomeres not modified.

Comments: Superficially similar to *Pseudoscelida biru* Mohamedsaid from Malaysia, but can be easily differentiated by a variety of features including the shape of the aedeagus.

Etymology: The species name refers to the country in which this species was collected.



FIGURES 17–20. *Taumaceroides sinicus*. 17, antenna; 18, profemora and protibia; 19, aedeagus, ventral view; 20, aedeagus, lateral view.

***Yunnaniata* Lopatin, new genus**

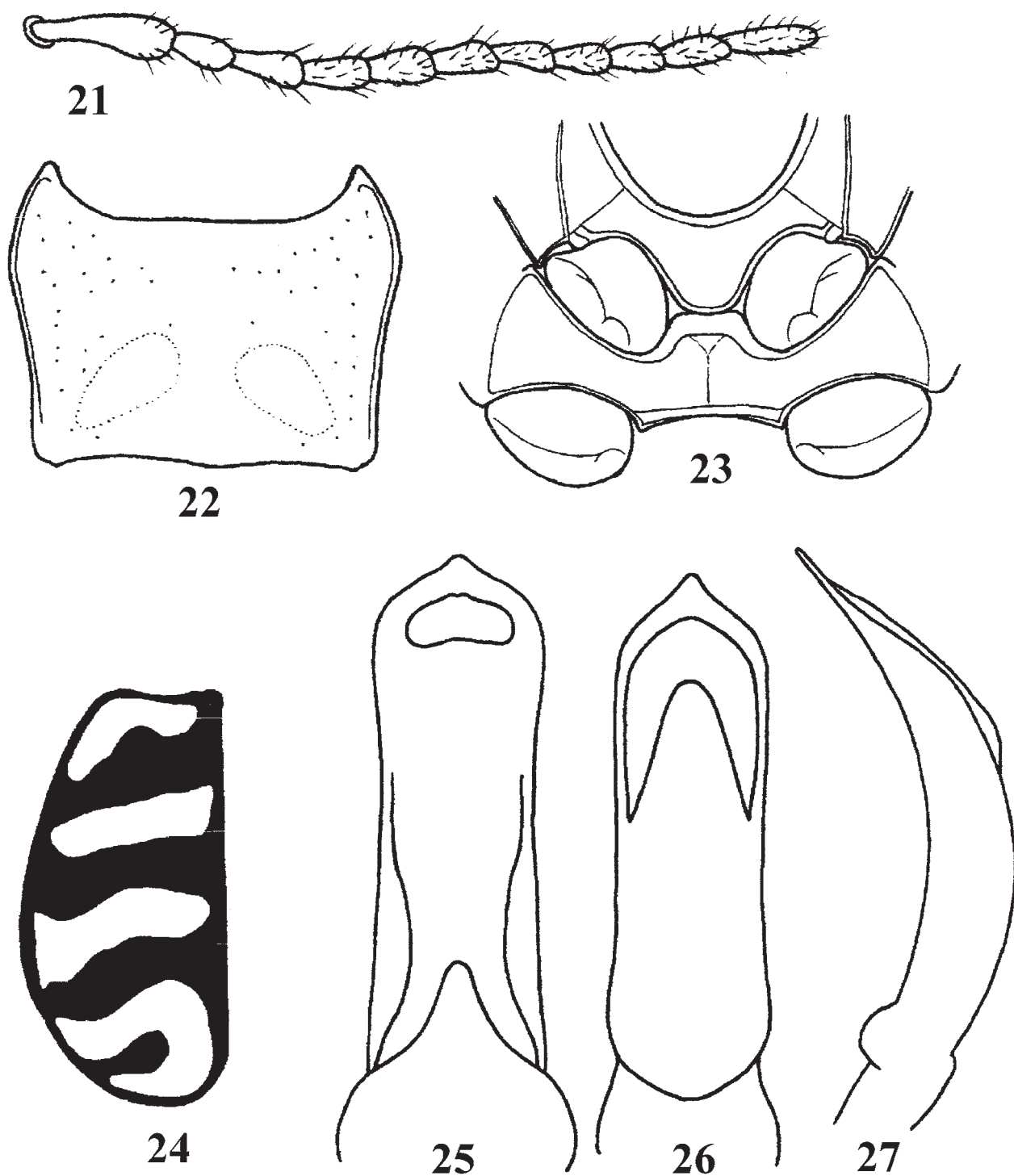
(Figs 21–27)

Body length 8.0 mm, width at humeral calli 3.0 mm, width at posterior third of elytra 5.0 mm. Body widely ovoid, strongly widening posteriorly. Flightless. Antennae short, wide (Fig. 21). Antennomere two slightly shorter than three or four (Fig. 21). Maxillary palpi slender, palpomeres two and three strongly widening distally, nearly triangular. Palpomere four small and narrow, narrowing distally. Antennal calli nearly triangular.

Pronotum (Fig. 22) weakly convex, with anterior corners protruding anteriorly. Pronotal sides straight and parallel-sided from base to middle, widening and rounded towards apex. Pronotal disk with light impressions on sides. Anterior margin with slight border. Lateral margins slightly swollen and separated by thin longitudinal impression visible only anteriorly.

Elytra with rounded humeri, anteriorly much wider than pronotum. Elytral punctures confused. Epipleura wide, narrowing across metacoxae, disappearing before apex.

Procoxal cavities open. Intercoxal prosternal process narrow, widening posteriorly. Mesosternum wide, strongly bordered, widely connected with metasternum (Fig. 23).



FIGURES 21–27. *Yunnaniata konstantinovi*. 21, antenna; 22, pronotum; 23, meso- and metasterna; 24, elytron; 25, aedeagus, ventral view; 26, aedeagus, dorsal view; 27, aedeagus, lateral view.

Legs thick, meso- and metatibiae with short, poorly visible spur. First metatarsomere as long as two following tarsomeres together. Ventral surface of tarsomeres covered with thick hairs, only third tarsomere has thin, bare groove. Claw with denticle.

Type species: *Yunnaniata konstantinovi* Lopatin, new species.

Comments: *Yunnaniata* is similar to *Spitiella* Laboissierre and *Paraspitiella* Chen and Jang, but can be separated from both genera by its thick and short antenna, with antennomeres two to seven of the same length.

Yunnaniata also can be separated from *Spitiella* by the open procoxal cavities and small eyes, and from *Paraspitiella* by the absence of the hind wings, the shape of the pronotum, and wide elytra.

Etymology: The generic name refers to the type locality.

***Yunnaniata konstantinovi* Lopatin, new species**

(Figs 21–27)

Holotype, male. China, Yunnan, Lijiang, Yulongshan, Prim forest 2800 m, N 27°28'20"E 100°14'6", 29.V.2002, leg. A. Konstantinov & M. Volkovitsh (IZAS).

Body black, weakly shiny, elytra with four reddish-yellow transverse bands, not reaching sutural or lateral margins (Fig. 24).

Head protruding. Frontal ridge convex, triangular. Antennal sockets situated close to each other. Antennal calli weakly convex. Labrum with broad impression in middle of anterior margin. Gena and sides of mandibles covered with long, stiff bristles. Antenna short and relatively thick. Proportions of antennomeres as follows: 15:8:7:8:8:8:8:7:11:12.

Pronotum nearly flat, with wide and shallow impressions on sides of disc (Fig. 22). Pronotal surface densely and minutely shagreened with sparse punctures on sides and near base. Anterior angles strongly protruding forward, separated by deep furrow, and bearing a large setiferous pore. Scutellum large and short, without punctures. Elytra narrow at humeri, widening strongly to posterior third. Sutural margins rounded. Elytral surface densely and minutely shagreened, with small and sparse punctures. Distance between punctures about twice as large as diameter of puncture. Elytral margins slightly swollen, separated by deep, narrow furrow.

Venter densely and minutely shagreened. Posterior side of abdominal ventrites with rows of small punctures. Tibiae with rows of stiff bristles. First tarsomere of all legs elongate, wide distally. Aedeagus as in Figs 25–27.

Etymology. This species is named after A. S. Konstantinov.

***Calomicrus yunnanus* Lopatin, new species**

(Figs 28, 29)

Holotype, male. China, Yunnan, Xiaguan-Dacang, 19 km, 08.VI.2002, 1900 m, river side, N 25°28'53" E 100°15'42" A. Konstantinov & M. Volkovitsh leg (IZAS). Paratypes 22 specimens. China, Yunnan, Tiger Leaping Gorge, 2000 m, N 27°04'53" E 100°04'31", 25.V.2002; Dali-Lijiang, 40 km, 2500 m, 24.V.2002, N 26°04'54" E 100°09'39"; Xiaguan-Kunming Rd. 150 km, 1600 m, N 24°59'06" E 101°43'43", 10.VI.2002, A. Konstantinov & M. Volkovitsh leg. (18 USNM, 4 ZMAS).

Body length 4.0 mm, width 2.0 mm. Body bluish-green with metallic lustre. Labrum and antennae, except antennomere one, black. Antennomere one with greenish luster. Legs blackish-green. Abdomen, except ventrite one, orange-yellow.

Antennal calli convex, delimited by deep furrows. Frontal ridge strongly convex, widening triangularly ventrally. Frons and vertex smooth and shiny. Labrum large, convex, with groups of long setae on sides. Antennae shorter than body. Antennomeres two as long as three, antennomere four slightly shorter than two and three together.

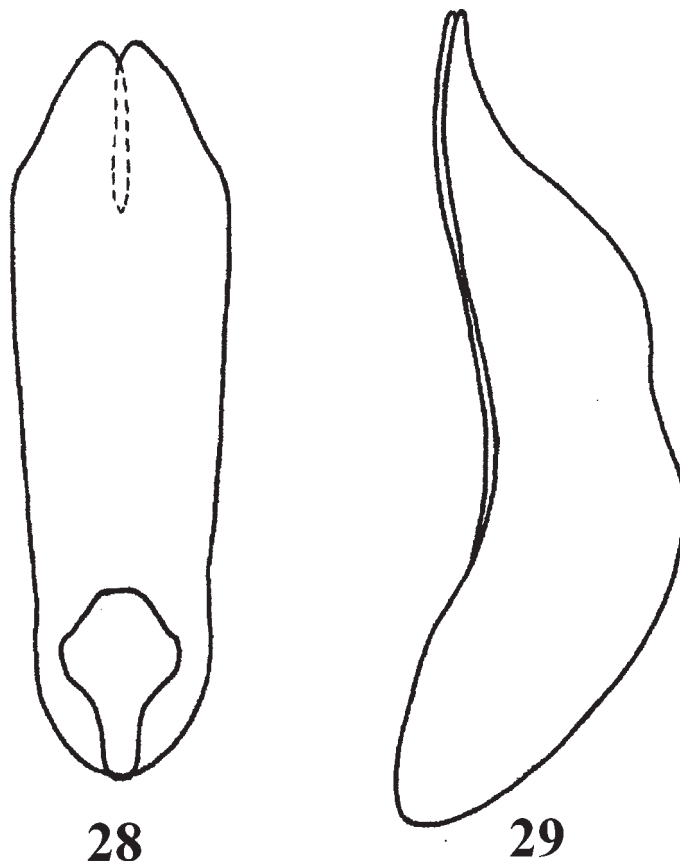
Pronotum 1.34 times wider than long with sides evenly rounded and maximum width in middle. Disc with two shallow, round impressions covered with sparse and small punctures. Lateral explanation wide on anterior and posterior corners, well visible from above.

Elytra three times as long as pronotum and 1.5 times as wide as long. Maximum width posterior of middle. Elytral punctures small. Distance between punctures as long as diameter of puncture in basal part,

apically punctures much smaller. Aedeagus as in Figs 28, 29.

Comments: *Calomicrus yunnanus* is close to *C. parvicollis* (Weise) from which it can be separated by the shape of the sides of the pronotum being more convex and the shape of the aedeagus. The apical part of the aedeagus is strongly converging posteriorly with a small notch at the tip. The apical part of the aedeagus of *C. parvicollis* is widened abruptly, flattened and lacks notches at the tip.

Etymology: The species name refers to the type locality.



FIGURES 28–29. *Calomicrus yunnanus*, aedeagus. 28, ventral view; 29, lateral view.

***Calomicrus minutissimus* Lopatin, new species**

(Figs 30–32)

Holotype, male. China, Yunnan, env. Dali, Cangshan Mts., 3700–3500 m, forest trail, N 25E41'06" E 100°06'13", 06.VI.2002, A. Konstantinov & M. Volkovitsh (IZAS). Paratypes, 7 specimens with the same label as holotype (5 USNM, 2 ZMAS).

Body length 2.7 mm. Body elongate, weakly widening posteriorly. Head, pronotum and ventral side of body black with light greenish-gold shine. Elytra dark green with metallic lustre, not as shiny as pronotum. Labrum reddish-brown, antennae and legs light yellow, metafemur and distal antennomeres darkened.

Frons and vertex covered with small and sparse punctures. Antennal calli convex, smooth, clearly separated from frons and vertex. Frontal ridge short, convex, forms triangle with anterofrontal ridge. Gena short. Labrum wide, with straight margin. Antennae longer than half of body length. Antennomere three as long as two, but slightly thinner.

Pronotum transverse, 2.6 times wider than long, with sides widely rounded, and maximum width in middle. Disc covered with small punctures, anteriorly distance between punctures greater than their diameter. Lateral sides of pronotum broadly explanate, with row of deep punctures merging with each other. Anterior

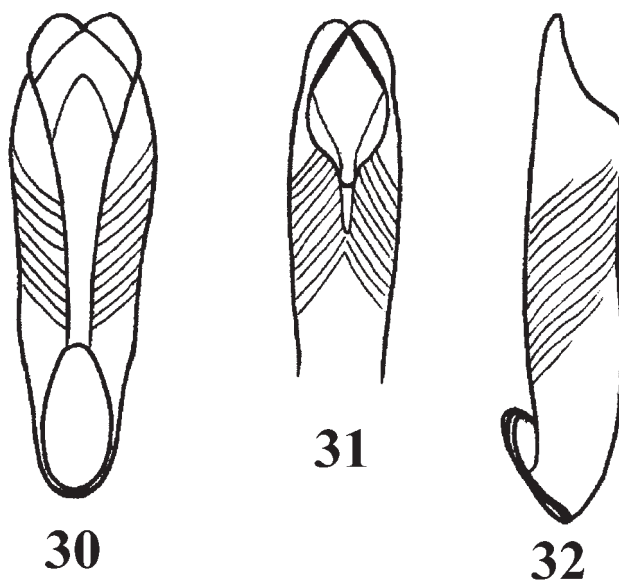
and posterior corners blunt, latter slightly protruding.

Elytra 4.4 times longer than pronotum and 2.0 times longer than wide. Sides nearly parallel in anterior half. In posterior half, sides weakly widening and then narrowing towards apices. Elytral punctures much larger and denser than pronotal, arranged in closely situated striae. Diameter of punctures twice as great as distance between punctures. Elytral apex widely rounded. Apical slope with sparse and short hairs.

Pygidium narrowly triangular with rounded apex, covered with erected hairs. Legs thin with dense, erected setae. Claw with denticle. Aedeagus as in Figs 30–32.

Comments: *Calomicrus minutissimus* may be separated from the Chinese species of the genus by its smaller body size, the dense punctation, and the shape of the aedeagus, which is straight in lateral view, cylindrical and bears a deep and sharply defined groove ventrally (Figs 30, 31).

Etymology: The species name refers to the small size of the beetle body.



FIGURES 30–32. *Calomicrus minutissimus*, aedeagus. 30, ventral view; 31, dorsal view; 32, lateral view.

Alticini

Hermaphroditus belkadavi Konstantinov, new species

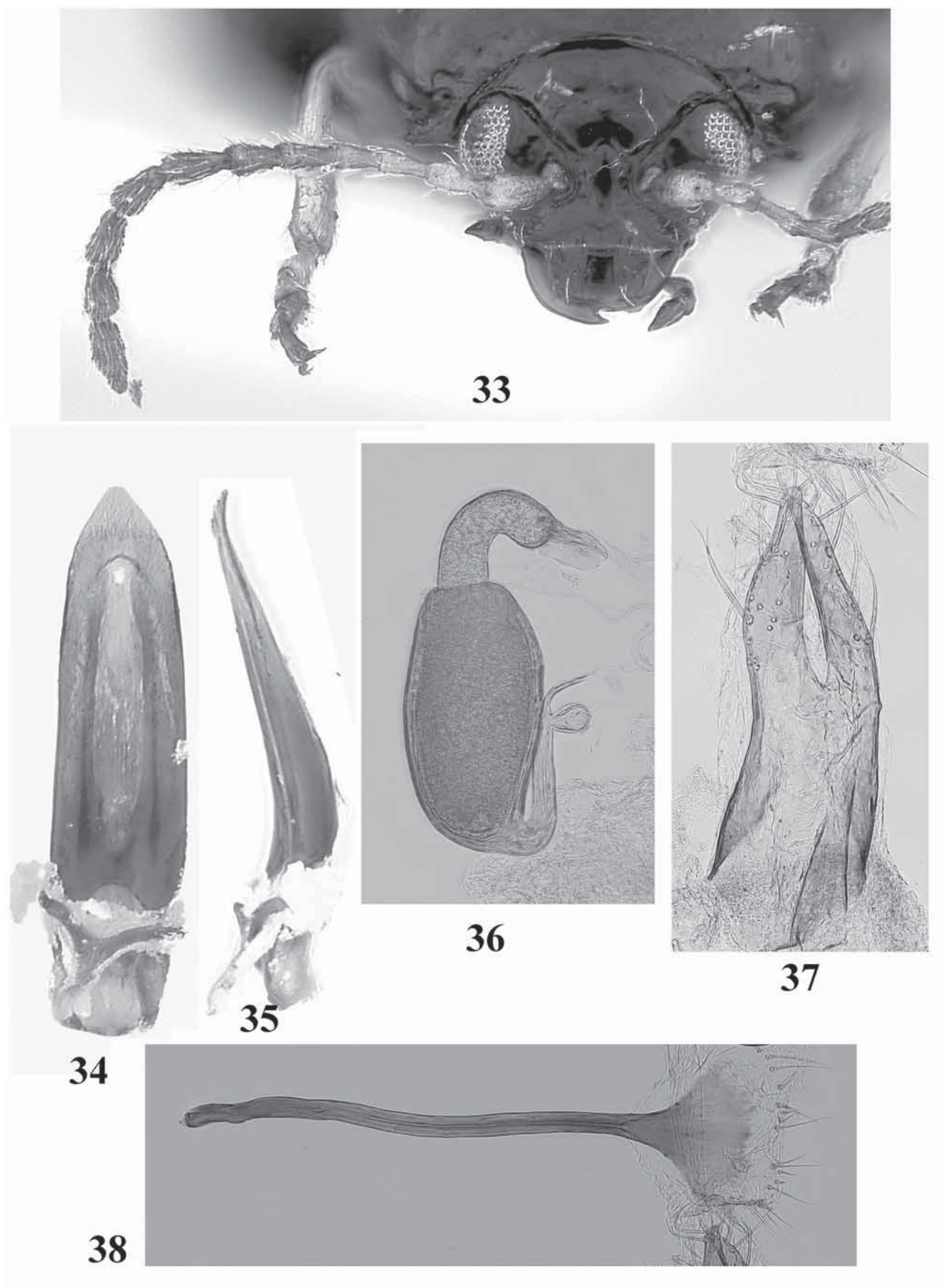
(Figs 33–38)

Holotype, male. China, S. Sichuan, near Bijishan village, left tr. of Lianhegou river, 2500–3200m, 19. VI.2000, Belousov, Kabak, Davidian (ZMAS). Paratypes, 9 specimens with the same labels as holotype (7 USNM, 2 ZMAS).

Body length 2.65–2.85 mm, width 1.35–1.72 mm. Head and pronotum black with light bluish tint. Antennomeres one to five and all tibiae and tarsi yellow. Antennomeres six to 11 and all femora brownish.

Head (Fig. 33) slightly convex in lateral view (frons and vertex form slightly convex line in lateral view). Vertex shiny, without punctures and wrinkles in middle. Supracallinal sulci absent, but head surface bends from antennal calli to vertex thus separating antennal calli from it. Midfrontal sulcus deep, well visible. Orbital and supraorbital sulci deep and relatively wide, being most noticeable sulci on head. Suprafrontal sulcus deep. Frontal ridge narrows between antennal calli, also narrowing ventrally forming denticle at anterofrontal ridge (Fig. 33). Antennomere two nearly as long as three, but longer than four.

Pronotum slightly swollen anterolaterally, with anterolateral callosity forming acute denticle. Antebasal transverse impression shallow in middle, deepens laterally. Disc nearly lacking punctures. Procoxal cavities widely open. Intercoxal prosternal process extends posteriorly beyond coxae.



FIGURES 33–38. *Hermaeophaga belkadavi*. 33, head, frontal view; 34, median lobe of aedeagus, ventral view; 35, median lobe of aedeagus, lateral view; 36, spermatheca; 37, vaginal palpi; 38, tignum.

Elytron with well developed humeral callus, widest nearly at middle. Punctures confused, distance between them varies significantly. Elytral slopes nearly vertical at basal one third.

Median lobe of aedeagus (Fig. 34,35) slightly converging posteriorly in ventral view, nearly straight in lateral view with apex bent dorsally. Apex lacking defined denticle in ventral view. Apical part of longitudinal impression narrowing abruptly.

Spermatheca with pump clearly separated from receptacle (Fig. 36). Apical part of pump rounded, but not wider than base of horizontal part. Flattened part of pump curved. Vaginal palpi merged together with external side of apex slightly concave in middle (Fig. 37). Tignum with stalk curved in middle and anteriorly (Fig. 38).

Comments: *Hermaeophaga belkadavi* can be separated from all other Eurasian species of the genus with the help of the following key, where it is in the same couplet with *H. adamsi* Baly. It can be separated from it by the larger body (about 2.70 mm—*H. adamsi* is about 1.8 mm); the midfrontal sulcus deep and well visible and the pro- and mesofemora brownish, as dark as metafemora.

Etymology: The species name refers to I. Belousov, I. Kabak, and G. Davidian who collected these remarkable beetles.

***Hermaeophaga dali* Konstantinov, new species**

(Figs 39–44)

Holotype, male. China, Yunnan, Dali, Wenshui, *Paederia foetida*, 04.VI.2002. 2000m, N25°59'55'' E100°02'32'', leg. A. Konstantinov & M. Volkovitsh (IZAS). Paratypes 10 specimens (8 USNM, 2 ZMAS).

Body length 1.94–2.05 mm, width 1.16–1.18 mm. Head and pronotum black with light bronzy tint, as dark as elytra. Antennae entirely black.

Head (Fig. 39) slightly convex in lateral view (frons and vertex form slightly convex line in lateral view). Vertex shiny, without punctures or wrinkles in middle. Supracallinal sulci absent, but head surface bends from antennal calli to vertex thus separating antennal calli from it. Midfrontal sulcus present, well visible only at base. Orbital and supraorbital sulci deep and relatively wide, being most noticeable sulci on head. Suprafrontal sulcus deep. Frontal ridge narrows between antennal calli also narrowing ventrally forming denticle at anterofrontal ridge (Fig. 39). Antennomere two slightly longer than three and four separately.

Pronotum slightly swollen anterolaterally, with anterolateral callosity forming acute denticle. Antebasal transverse impression deep in middle, as deep as laterally. Disc with small dense and sharp punctures. Procoxal cavities widely open. Intercostal prosternal process extends posteriorly beyond coxae.

Elytron with well developed humeral callus, widest nearly at middle. Punctures confused, distance between them varies significantly. Larger punctures form irregular striae with smaller punctures placed in between. Elytral slopes nearly vertical at basal one third.

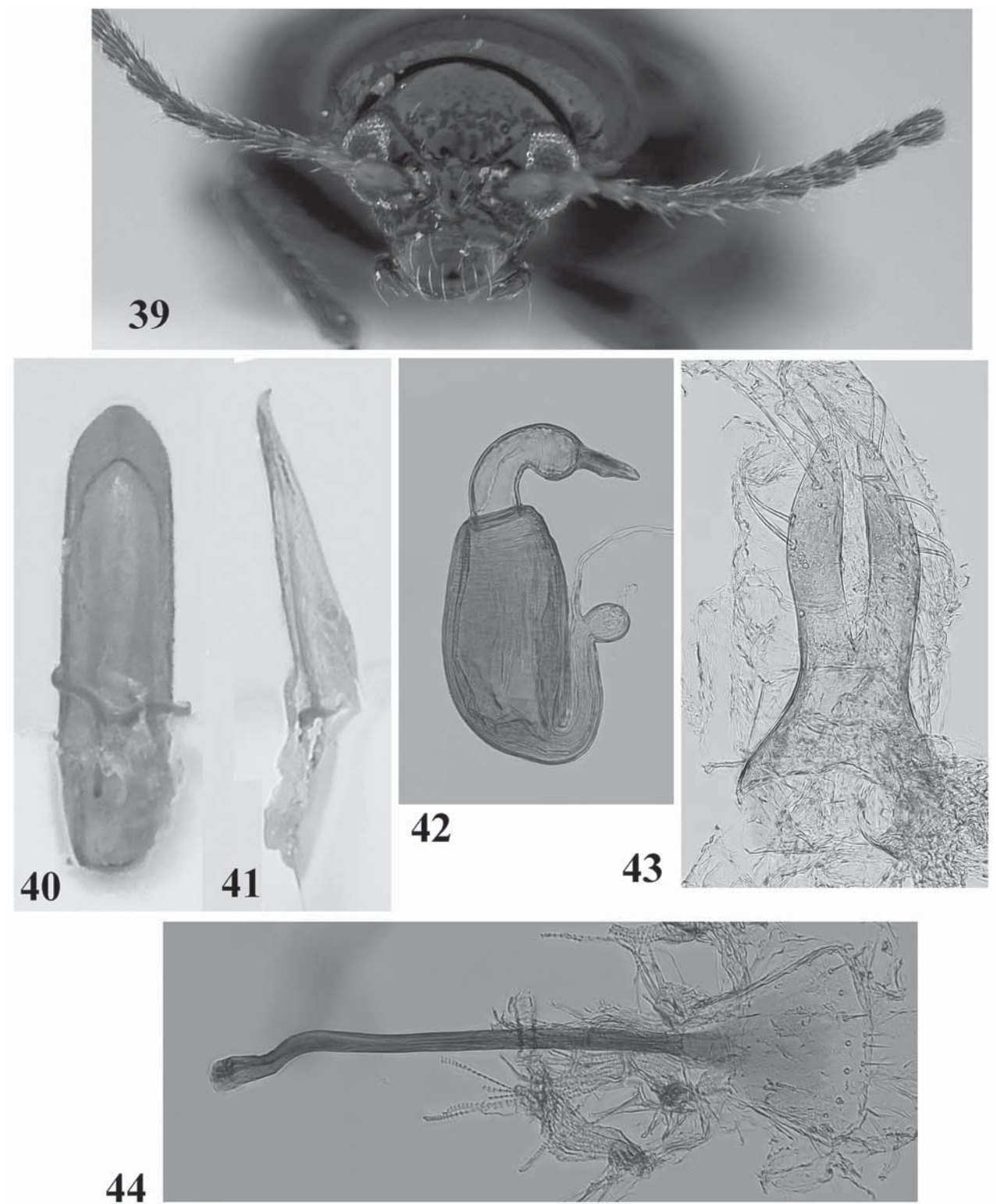
Median lobe of aedeagus (Figs 40, 41) parallel-sided, not constricted before apex in ventral view, nearly straight in lateral view with apex strongly bent dorsally. Apex flat, lacking defined denticle in ventral view. Apical part of longitudinal impression narrows gradually.

Spermatheca with pump clearly separated from receptacle (Fig. 42). Apical part of pump rounded, slightly wider than base of horizontal part. Flattened part of pump straight. Vaginal palpi merged together with external side of apex slightly convex in middle (Fig. 43). Tignum with stalk straight in middle and strongly curved anteriorly (Fig. 44).

Host plant: *Paederia foetida* L. (Rubiaceae).

Comments: *Hermaeophaga dali* can be separated from all other Eurasian species of the genus with the help of the following key, where it is in the same couplet with *H. flavitarsa* Doberl. It can be separated from it by the tarsi being dark brown, as dark as the tibiae, and the median lobe of the aedeagus is parallel-sided and not constricted before the apex, with the apical denticle strongly bent dorsally.

Etymology: This species name refers to the type locality.



FIGURES 39–44. *Hermaeophaga dali*. 39, head, frontal view; 40, median lobe of aedeagus, ventral view; 41, median lobe of aedeagus, lateral view; 42, spermatheca; 43, vaginal palpi; 44, tignum.

***Hermaphysa korotyaevi* Konstantinov, new species**

(Figs 45–47)

Holotype, male. South Korea, GN Prov., Mt Juri Sancheong City, Sicheonmyeon, Sincheonri, 17.V.2000 leg. B. Korotyaev (ZMAS)

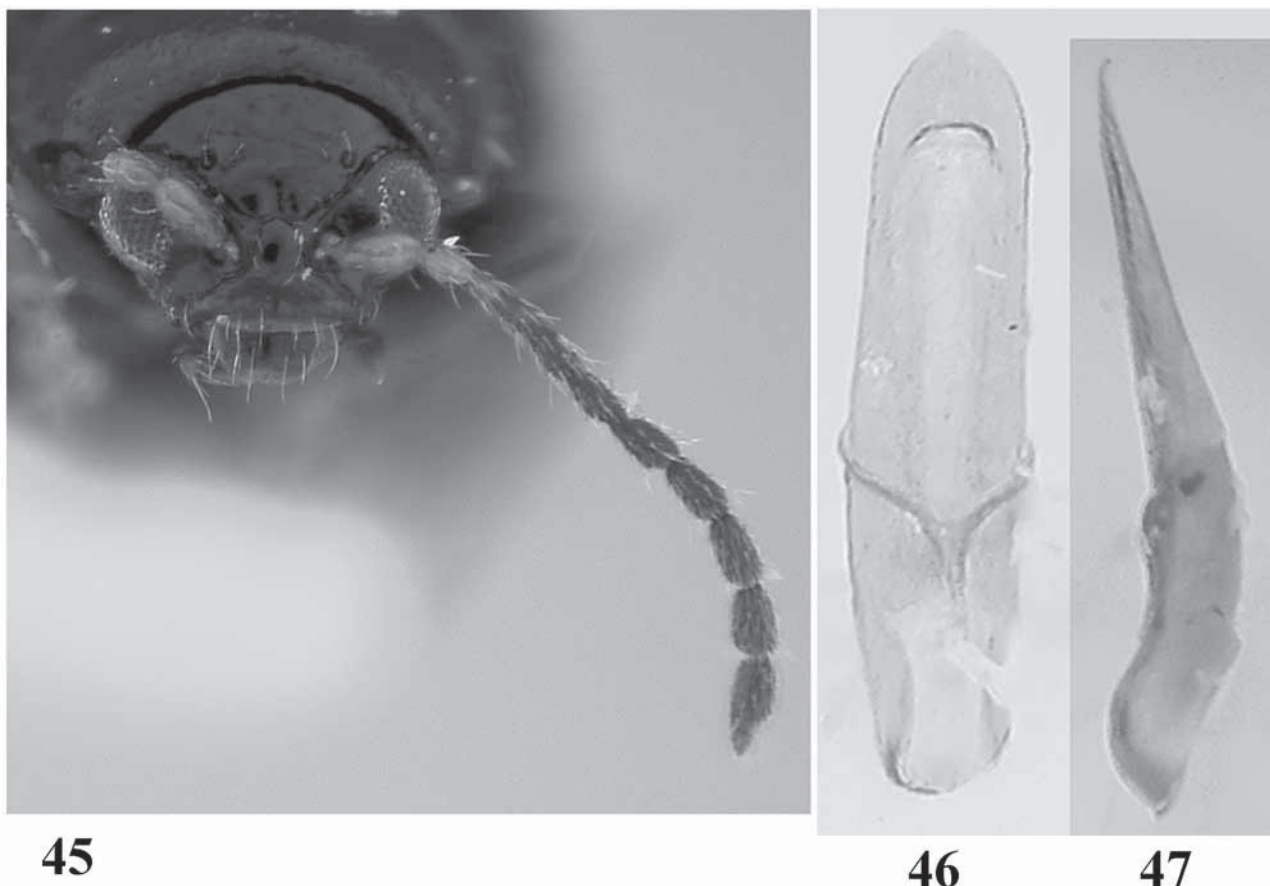
Body length 1.72 mm, width 1.08 mm. Head and pronotum black with light bronzish tint, as dark as elytra. Antennomeres one, two, and three yellowish, much lighter than rest. Pro- and mesotibiae somewhat darkened, nearly as dark as pro- and mesofemora.

Head (Fig. 45) slightly convex in lateral view (frons and vertex form slightly convex line in lateral view). Vertex shiny, without punctures or wrinkles in middle. Supracallinal sulci absent, but head surface bends from antennal calli to vertex thus separating antennal calli from it. Midfrontal sulcus present, well visible only at base. Orbital and supraorbital sulci deep and relatively wide, being most noticeable sulci on head. Suprafrontal sulcus deep. Frontal ridge narrows between antennal calli also narrowing ventrally forming denticle at anterofrontal ridge (Fig. 45). Antennomere two slightly longer than three or four separately.

Pronotum slightly swollen anterolaterally, with anterolateral callosity forming acute denticle. Antebasal transverse impression deep in middle, as deep as laterally. Disc with small dense and sharp punctures. Procoxal cavities widely open. Intercoxal prosternal process extends posteriorly beyond coxae.

Elytron with well developed humeral callus, widest nearly at middle. Punctures confused, distance between them varies significantly. Larger punctures form irregular striae with smaller punctures placed in between. Elytral slopes nearly vertical at basal one third.

Median lobe of aedeagus (Figs 46, 47) slightly narrowing apically, not constricted before apex in ventral view, nearly straight in lateral view with apex strongly bent dorsally. Apex rounded, lacking defined denticle in ventral view. Apical part of longitudinal impression narrows gradually.



FIGURES 45–47. *Hermaphysa korotyaevi*. 45, head, frontal view; 46, median lobe of aedeagus, ventral view; 47, median lobe of aedeagus, lateral view.

Comments: *Hermaeophaga korotyaevi* can be separated from all other Eurasian species of the genus with the help of the following key, where it is in the vicinity of *H. mercurialis* F. and *H. cicatrix* Illiger. It can be separated from both of them by the frontal ridge dorsally as narrow as ventrally, forming denticle above clypeus and the third antennomere shorter than the second. *Hermaeophaga korotyaevi* is also similar to *H. dali* and can be separated from it by the following characters: the basal antennomeres and the tarsi are much lighter than in *H. dali*; the apex of the median lobe of the aedeagus is narrowly rounded (it is flat in *H. dali*); border that limits ventral longitudinal impression broadly rounded, almost flat (it is triangular in *H. dali*).

Etymology: This species is named after B. A. Korotyaev who collected it.

Key to *Hermaeophaga* species of Eurasia

1. Head and pronotum much darker than elytra. Russia: Transbaikalia..... *H. nigricornis* Ogloblin
Head and pronotum as dark as elytra 2
- 2(1). Antenna entirely black, second and third antennomeres as dark as rest 3
At least second and third antennomeres yellow or light brown, lighter than rest 4
- 3(2). Tarsi light brown to yellowish, lighter than tibiae. Median lobe of aedeagus slightly constricted before apex, with apical denticle slightly bent dorsally. Nepal..... *H. flavitarsa* Doberl
Tarsi dark brown, as dark as tibiae. Median lobe of aedeagus parallel-sided, not constricted before apex, with apical denticle strongly bent dorsally. China *H. dali* Konstantinov, new species
- 4(2). Pro- and mesotibiae uniformly yellow 5
Pro- and mesotibiae somewhat darkened 6
- 5(4). Body small, about 1.8 mm. Midfrontal sulcus shallow, barely perceptible. Pro- and mesofemora yellowish, much lighter than metafemora. Japan..... *H. adamsi* Baly
Body large, about 2.7 mm. Midfrontal sulcus deep, well visible. Pro- and mesofemora brownish, as dark as metafemora. China..... *H. belkadavi* Konstantinov, new species
- 6(4). Frontal ridge dorsally as narrow as ventrally, forming denticle above clypeus. Third antennomere shorter than second. South Korea *H. korotyaevi* Konstantinov, new species
Frontal ridge dorsally narrower than ventrally, without denticle above clypeus. Third antennomere as long or longer than second 7
- 7(6). Humeral calli poorly developed. Apical part of median lobe of aedeagus flattened, abruptly narrowing to apex. Europe, Asia Minor *H. mercurialis* F.
Humeral calli well developed. Apical part of median lobe of aedeagus convex, gradually narrowing to apex. SW Europe, N. Africa *H. cicatrix* Illiger

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Literature cited

- Gressitt, J. L. and Kimoto, S. (1961) The Chrysomelidae (Coleoptera) of China and Korea. *Pacific Insects Monographs*, 1A, 1–299.
- Gressitt, J. L. and Kimoto, S. (1963) The Chrysomelidae (Coleoptera) of China and Korea. Part 2. *Pacific Insects Monographs*, 1B, 301–1026.
- Heywood, V. H. (ed.) (1993) Flowering plants of the World. Oxford University Press. New York. 335 pp.
- Jolivet, P. and Hawkeswood, T. (1995) Host-plants of Chrysomelidae of the World. Backhuys Publishers, Leiden. 281 pp.
- Konstantinov, A. S. (1998) Revision of the Palearctic species of *Aphthona* Chevrolat and cladistic classification of the Aphthonini (Coleoptera: Chrysomelidae: Alticinae). Associated Publishers. *Memoirs on Entomology International*, Gainesville, Florida. 429 pp.

- Lopatin, I. K. (2002a) New species of leaf beetle subfamily Chrysomelinae (Coleoptera: Chrysomelidae) from China. I. *Entomologicheskoe Obozrenie*, 81(1), 111–120.
- Lopatin, I. K. (2002b) New species of leaf beetles (Coleoptera: Chrysomelidae) from China. II. *Entomologicheskoe Obozrenie*, 81(4), 874–882.
- Lopatin, I. K. (2004) New species of leaf beetles (Coleoptera: Chrysomelidae) from China. III. *Entomologicheskoe Obozrenie*, 83(3), 614–621.
- Lopatin, I. K. (2005a) New species of leaf beetles (Coleoptera: Chrysomelidae) from China. IV. *Entomologicheskoe Obozrenie*, 84(3), 569–575.
- Lopatin, I. K. (2005b) New species of leaf beetles (Coleoptera: Chrysomelidae) from China. V. *Entomologicheskoe Obozrenie*, 84(4), 873–880.
- Lopatin, I. K. (2006) New species of leaf beetles (Coleoptera: Chrysomelidae) from China. VI. *Entomologicheskoe Obozrenie*, 85(3), 593–601.
- Lopatin, I. K. (2007) New species of leaf beetles (Coleoptera: Chrysomelidae) from China. VII. *Entomologicheskoe Obozrenie*, 86(1), 176–184.
- Okamoto, C., Tsuda, K., Yamaguchi, D., Sato, S., Pemberton, R. and Yukawa, J. (2008) Life history and host specificity of the Japanese flea beetles *Trachyaphthona sordida* and *T. nigrita* (Coleoptera: Chrysomelidae), potential biological control agents against skunk vine, *Paederia foetida* (Rubiaceae), in the southeastern parts of the United States and Hawaii. *Entomological Science*, 11, 143–152.
- Pemberton, R. W. and Pratt, P. D. (2008) Skunk Vine. [http://www. Invasive.org/eastern/biocontrol/27SkunkVine.html](http://www.Invasive.org/eastern/biocontrol/27SkunkVine.html). (Accessed 13.VIII.2008).